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assistance guaranteed them by all the leading ornithologists of Europe, with the support of a good list of subscribers, will make the work a decided success in every way. Both the authors are well known as practical field naturalists, and the successful manner in which Mr. Sharpe has just completed his "Monograph of the Kingfishers" is sufficient evidence that the work will be carried through the press in the best manner possible.

As the work will hardly be accessible for the private libraries of most of the ornithologists of our country, owing to its necessarily high cost, it should have a place in all our large libraries, where those who cannot afford to own the work, can at least have a chance of consulting its pages: and as many of our birds are identical with those of Europe, and many others very closely allied, it will become the duty of every one engaged in the study of birds to consult this splendid monograph. The work is published by the authors, by special permission, at the office of the Zoological Society of London, where we should be pleased to forward the names of subscribers.

ECONOMIC ENTOMOLOGY IN MASSACHUSETTS.*—This first report on the injurious and beneficial insects of Massachusetts opens with some general remarks on the losses sustained by insects. In this country alone they are estimated at not far from five hundred

Fig. 81.

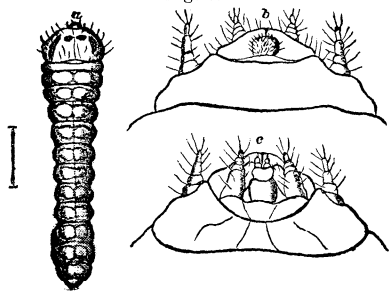
Larva of *Callidium amoenum*.

Fig. 82.

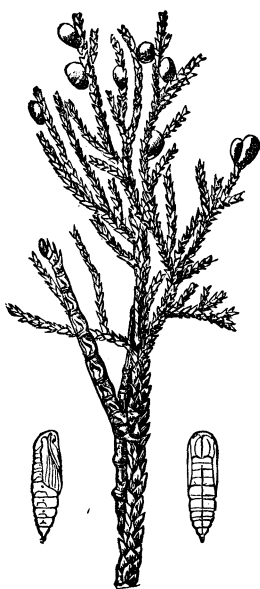
*Drepanodes juniperaria*.

million dollars annually, of which amount, at least one-tenth, or fifty millions, could probably be saved by human exertions, were

*First Annual Report on the Injurious and Beneficial Insects of Massachusetts. By A. S. Packard, jr., M. D. Entomologist to the State Board of Agriculture. Boston, 1871. 8vo. pp. 31. Extracted from the Annual Report of the Secretary of the Mass. Board of Agriculture, from which the illustrations here used were taken.

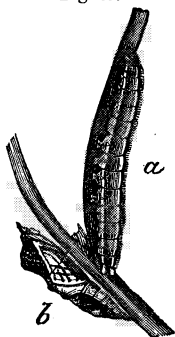
farmers made better acquainted with the habits of insects and the best means of combating them.

Fig. 83.

Larva and Pupa of *Drepanodes juniperaria*.

destructive insect, the Rape caterpillar, *Pieris rapæ*, (Fig. 86, male; 87, female;

Fig. 85.

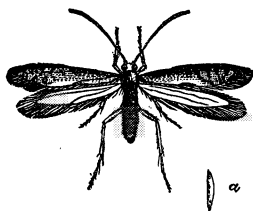


85 *a*, larva, *b*, chrysalis) which annually does two hundred and fifty thousand dollars worth of damage to the cabbage crop about Quebec alone, is now abundantly distributed over New England, and southward as far as New Jersey. During the last two years it has been common at Orono, Maine.

A new insect is described as infesting the limbs of the apple tree. It is the *Leiopus facetus* of Say (fig. 91). The larva can scarcely be distinguished from that of a species infesting the prickly ash, the *L. xanthoxyli* Shimer (Fig. 92 90 *a*, larva, *b* upper, and *c* under side of the head.) A somewhat similar borer which injures the grape vine is noticed. This is

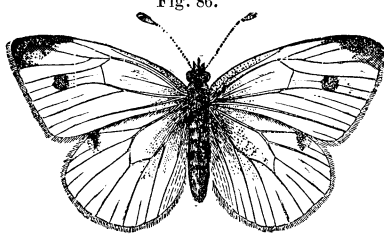
Then follows an account of the European saw-fly (*Nematus ventricosus*, fig. 88, larva, *a*, enlarged; 89, *a*, male; *b*, female) doing so much damage in the state. It is stated that June 29th the worms of the second brood were spinning their cocoons. It might be added that in the first and second weeks of August the worms were still on the bushes in Salem, and the females of the second brood were laying eggs for a third brood of worms. This destructive saw-fly is now pretty well distributed over New England. At Orono, Maine, early in July they were very destructive, and had been so the year previous.

Fig. 84.



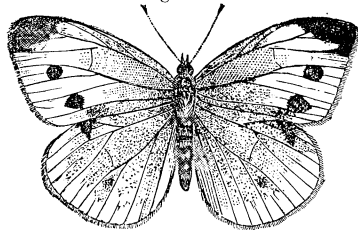
Cedar Bucculatrix.

Fig. 86.



Rape Butterfly, male.

Fig. 87.



Rape Butterfly, female.

Fig. 88.



Larva of Currant Saw Fly.

a

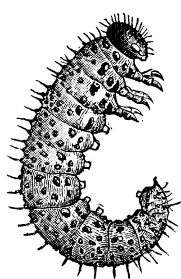
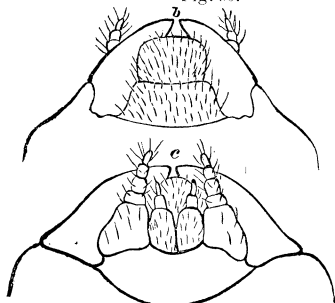


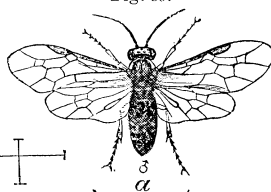
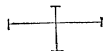
Fig. 89.

Fig. 90.

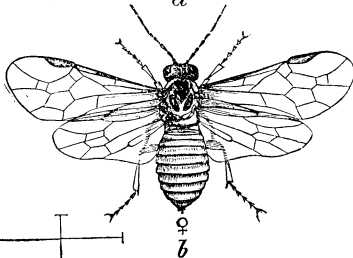


Larva of *Leiopus Xanthoxyti*.

a



♂



♀



Currant Saw Fly.

Fig. 91.

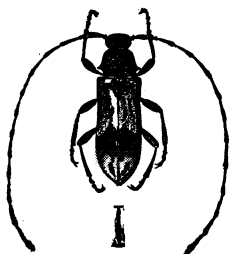
*Leiopus facetus.*

Fig. 92.

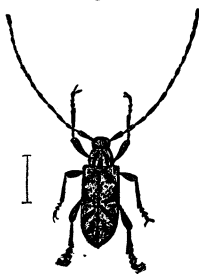


Fig. 93.

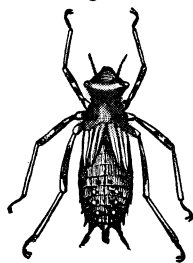
Larva of *Cordulia lateralis*.

Fig. 94.

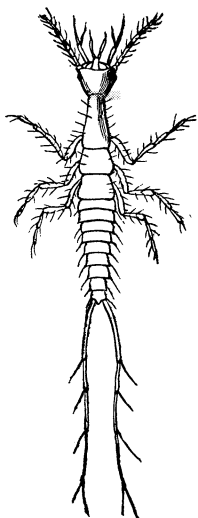
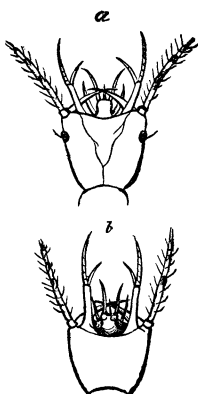
Larva of *Galerita Janus*.

Fig. 96.

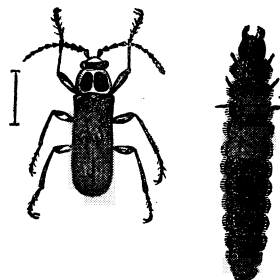
*Telephorus bilineatus* and larva.

Fig. 95.

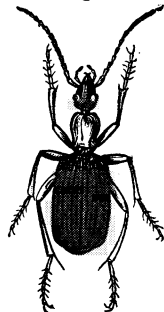
*Galerita Janus*.

Fig. 97.

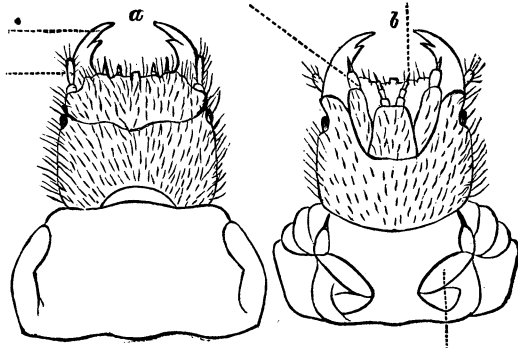
Larva of *Telephorus bilineatus*.

Fig. 98.

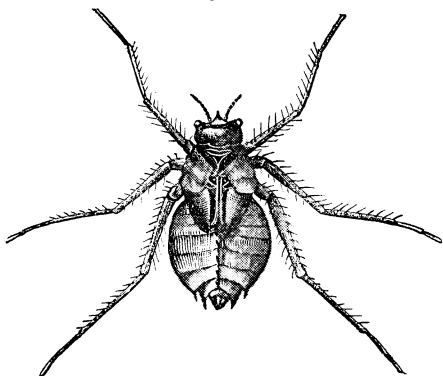
*Callidium amœnum*.

the *Callidium amœnum* Say (fig. 98). Its larva is represented by figure 81, *b*, upper, *c*, under side of the head.

One of the most wonderful cases of mimicry is that of a new span worm *Drepanodes juniperaria* Pack. (fig. 82 ; 83, larva and chrysalis) which can with difficulty be distinguished from the twigs of the juniper tree on which it feeds.

The cedar also has been found to be infested by a small Tinean, closely allied to the Apple Bucculatrix. This is described as the *B. thuiella* (fig. 84, enlarged ; *a*, cocoon, nat. size). The transformations of *Telephorus bilineatus* Say (fig. 96 ; larva, enlarged, and adjoining fig. 97 showing *a*, upper, and *b*, under side of the head) are also described. The larva was identified by Mr. P. S. Sprague, who found it under stones in spring, where it changes to a pupa, and early in May becomes a beetle, when it eats the leaves of the birch.

Fig. 99.



Larva of Didymops?

Among beneficial insects are mentioned the ground beetle, *Galerita Janus* Fabr. (fig. 95) whose singular larva (fig. 94, *a*, upper, *b*, under, side of the head), was discovered by Mr. J. H. Emerton under stones early in July. The larvæ of two dragon flies, *Cordulia lateralis* (fig. 93) and a species of *Didymops?* (fig. 99) are also noticed.

NATURAL HISTORY MISCELLANY.

BOTANY.

THE NUMBER OF PLANTS AND ANIMALS.—The days of a *Systema Naturæ*, or single work containing a synopsis of the genera and species of organized beings, are long since passed away.